

REMARKS

Claims 1-15 and 25-27 are pending in the application. The Office Action refers to all of claims 1-27. Claims 16-24 were cancelled previously. The following comments are directed to claims 1-15 and 25-27.

Rejections Under 35 U.S.C. §112

Claims 1-27 stand rejected under 35 U.S.C. §112, first and second paragraphs, for asserted lack of enablement and indefiniteness. At issue is the recitation in claim 1 of "a transition metal oxide containing an oxyanion of a Group IVA element". The Office Action points out that there is no chemical compound having both a transition metal oxide and a group for an oxyanion. The Office Action contains a typographical error, all references therein to "Group IVA" are understood as referring to "Group VIA". The specification discloses chromium oxides, molybdenum oxides and tungsten oxides as suitable transition metal oxides, i.e. oxides of Group VIA of the periodic table. Therefore, claim 1 is amended to specify "a transition metal oxide of a Group VIA element". In view of the amendment to claim 1, the rejections for lack of enablement and indefiniteness of claims 1-11 are believed to be overcome.

To the extent that the rejections for lack of enablement and indefiniteness were intended to be applied against claims 12-15 and 25-27, those rejections should be withdrawn. Claims 12-15 and 25-27 require the use of tungsten trioxide and do not recite any metal oxide by reference to a group in the periodic table. Accordingly, claims 12-15 and 25-27 also meet the statutory requirements of 35 U.S.C. §112.

Prior Art Rejections Based on JP 10-60229

Claims 1, 11, 13 and 25 stand rejected under 35 U.S.C. §102(b) for anticipation by Japanese Patent No. 10-60229. Claims 2-10, 12 and 14-27 are rejected under 35 U.S.C. §103(a) for obviousness over JP '229 in view of U.S. Patent No. 6,432,410 to Gallo. These rejections are understood to apply to the pending claims. Applicants respectfully traverse these rejections in view of the amendment to claims 1, 12 and 27 regarding the absence of phosphorous in the flame retardant molding composition and for the following reasons.

The present invention is directed to a flame retardant molding composition that is substantially free of halogen, antimony and phosphorous. Claims 1, 12 and 27 have

been amended to recite that the claimed molding compositions are free of phosphorous in addition to being free of halogen and antimony. Support therefor appears at least at page 2, paragraph 8 of the specification. As detailed therein, phosphorous containing flame retardant compounds are undesirable in that they tend to absorb moisture which can cause stress and cracking of a molding composition at elevated temperatures. The present invention solves this problem by excluding phosphorous, as well as halogen and antimony from the molding composition.

In contrast, the resin composition disclosed in JP '229 contains a flame retardant that includes a metal hydrate, an aromatic phosphoric ester, melamine cyanurate and molybdenum trioxide. The teaching of JP '229 is to include a phosphorous compound in a flame retardant. There is no suggestion to eliminate the phosphorous compound as in the present invention. In fact, JP '229 teaches that flame retardancy is best achieved when a phosphorous compound is used with other flame retardant materials in a resin composition. In view of the specific teachings of JP '229 to include phosphorous containing compounds in a flame retardant for a resin composition, JP '229 does not teach or suggest the present invention which excludes phosphorous therefrom. Claims 1, 12 and 27, as well as the claims that depend therefrom, exclude phosphorous and define over JP '229. Accordingly, the anticipation rejection of claims 1, 11, 13 and 25 over JP '229 should be withdrawn.

In addition, the rejection of claims 2-10, 12, 14, 15 and 25-27 for obviousness over the combination of JP '229 and the Gallo patent should also be withdrawn. The Gallo patent is cited for its disclosure of molding compositions that use particular epoxy resins and tungsten trioxide as a flame retardant. However, one skilled in the art would not be motivated to apply the teachings of JP '229 to produce a flame retardant molding composition that does not contain phosphorous. Accordingly, the obviousness rejection based on the combination of the teachings of JP '229 and the Gallo patent should be withdrawn.

Prior Art Rejections Based on JP 11-100492

Claims 1-27 are rejected under 35 U.S.C. §103(a) for obviousness over the Gallo patent, Japanese Patent No. 11-269347, and Japanese Patent No. 10-212396 in view of Japanese Patent No. 11-100492. Claims 1-27 are rejected under 35 U.S.C. §103(a) for obviousness over JP '492 in view of the Gallo patent and JP '347. The rejections are understood as being applicable to claims 1-15 and 25-27.

The rejection of claims 1-15 and 25-27 over the combination of the teachings of the Gallo patent with JP '347, JP '396 and JP '492 is traversed for the following reasons. The Gallo patent is relied upon for teaching a resin composition that contains tungsten trioxide as a flame retardant. JP '347 likewise discloses a molding composition that contains an epoxy resin, along with molybdenum oxide and/or tungsten oxide. JP '396 discloses an epoxy resin also containing molybdenum oxide or tungsten trioxide. As noted in the Office Action, none of these references disclose the use of melamine cyanurate as a flame retardant.

To overcome this deficiency, JP '492 is cited for assertedly teaching the combination of a metal oxide with melamine cyanurate as flame retardants in an epoxy resin composition. JP '492 is directed to a molding composition that contains an epoxy resin and an organic fire retardant agent. The reference discloses that certain inorganic fire retardant agents such as metal oxides and metal hydroxides may optionally be included as components of the fire retardant agent. The reference does not appreciate that a Group VIA transition metal oxide (not just a metal oxide) provides improved flame retardant characteristics.

Metal hydroxides function as flame retardants by decomposing and producing water when exposed to heat. A transition metal oxide cannot accomplish such a function. Therefore, one skilled in the art would not be motivated to substitute the WO_3 of Gallo for the optional metal hydroxide taught by JP '492.

The only metal oxide that is disclosed in JP '492 is nickel oxide. Nickel is a Group VIIIB element. In contrast, the present invention requires Group VIA transition metal oxides, along with melamine cyanurate. Nowhere does JP '492 provide any suggestion to use anything other than a simple metal oxide such as nickel oxide as an inorganic flame retardant along with an organic flame retardant.

In fact, JP '492 indicates that melamine cyanurate alone is sufficient as a flame retardant. Example 7 of JP '492 reports use of melamine cyanurate and nickel oxide. The flame retardant effect of including the inorganic oxide was not reported as showing any benefit. In view of the disclosed sufficiency of an organic flame retardant alone in JP '492, one skilled in the art would not look to another reference for adding a different type of metal oxide to the organic flame retardant (melamine cyanurate) taught in JP '492. There is no motivation provided in JP '492 for substituting the completely optional metal oxide (nickel oxide) for a transition metal oxide as claimed in the present invention. Moreover, the record

has demonstrated a significant synergistic effect of including a transition metal oxide and melamine cyanurate as flame retardants in a molding composition. JP '492 does not indicate that any superior results are achievable by including nickel oxide as a flame retardant along with melamine cyanurate. Actually, JP '492 teaches that nickel oxide is optional. One skilled in the art would not be motivated to replace an optional component (metal oxide, NiO) with a different component (transition metal oxide, WO₃). Accordingly, the rejection of claims 1-15 and 25-27 over the teachings of the Gallo patent, along with JP '347, JP '396 and JP '492 is respectfully traversed.

The rejection of claims 1-15 and 25-27 over JP '492, the Gallo patent and JP '347 is traversed for similar reasons. The Office Action again asserts that JP '492 espouses the use of metal oxides in combination with melamine cyanurate. Actually, there is only minimal disclosure in JP '492 regarding use of an inorganic flame retardant with an organic flame retardant. It provides no motivation for including a different component, namely a transition metal oxide, along with melamine cyanurate as flame retardants in a molding composition. There is no motivation to replace the metal oxide (NiO) of JP '492 with the tungsten trioxide of Gallo or JP '347. The Office Action asserts that Gallo describes at col. 1, lines 28-32, the use of a metal oxide to improve moisture resistance. That discussion in Gallo relates to the absence of a phosphorous containing compound as a flame retardant. JP '492 already avoids moisture resistance in that it does not disclose the use of a phosphorous compound therein. Accordingly, the combination of the Gallo patent for its teaching at col. 1, lines 28-32, along with JP '492 is inappropriate. Likewise, JP '347 discloses at [0011] that molybdenum oxide and zinc oxide can provide fire retardancy and hardenability. Those teachings do not supplement the basic deficiency of JP '492 to motivate one to modify that reference and use a metal oxide other than nickel oxide as disclosed therein. Accordingly, claims 1-14 and 15-27 define over the combined teachings of JP '492, Gallo and JP '347.

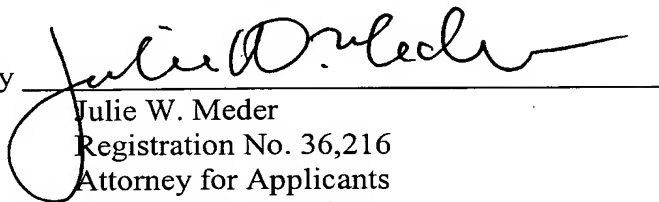
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In view of the amendments to claims 1, 12 and 27 and for the foregoing reasons, claims 1-15 and 25-27 are believed to define over the prior art of record and be in condition for allowance.

Respectfully submitted,

THE WEBB LAW FIRM

By

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